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Appeal Brief
12-12-02

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Shinsuke HENMI, et al.

Docket No: Q61431

Appln. No.: 09/695,840

Group Art Unit: 2834

Confirmation No.: 3264

Examiner: Karen B. ADDISON

Filed: October 26, 2000

For: BRUSH HOLDER FOR DYNAMO-ELECTRIC MACHINE

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Commissioner for Patents
Washington, D.C. 20231

Sir:

In accordance with the provisions of 37 C.F.R. § 1.192, Appellants submit the following:

I. REAL PARTY IN INTEREST

Based on information supplied by Appellants, and to the best of the Appellants' legal representatives' knowledge, the real party in interest is MITSUBISHI DENKI KABUSHIKI KAISHA.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representatives, and the assignee in this application are not aware of any other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-11 are all the claims pending. Claims 1-11 presently stand rejected.

Claims 1-11 are pending in this application.

Claims 1-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hockaday (6,246,144) in view of Takeuchi (5,810,111). On November 14, 2002, Applicants appealed the final rejection of claims 1-11.

Thus, claims 1-11 are being appealed and are in the attached Appendix.

IV. STATUS OF AMENDMENTS

Appellants filed an Amendment under 37 C.F.R. § 1.111 on June 18, 2001, wherein claims 5-7 were amended. An Amendment under 37 C.F.R. § 1.116 was filed on December 13, 2001 (wherein claim 1 was amended), which was forced into entry upon the filing of a Request for Continued Examination under 37 C.F.R. § 1.114 on February 13, 2002. Further, Applicants filed an Amendment under 37 C.F.R. § 1.111 on May 28, 2002, in which claim 1 was amended and claims 12-20 were canceled. Applicants filed a Notice of Appeal on November 14, 2002 in response to the Final Office Action dated August 14, 2002 (paper no. 16), to appeal from the final rejection of claims 1-11.

V. SUMMARY OF THE INVENTION

The present invention is directed to an improved structure of a brush holder for a dynamo-electric machine.

Conventional structures suffer from operating noise and torque ripples when the dynamo-electric machine is rotatable in both directions (page 2, lines 6-16, of specification). In particular, since the terminal plate is connected to the pigtail on the left or right side of the brush, the sliding of the brush is affected by the state of the pigtail and the rotational direction of the motor (page 2, lines 6-16 of specification).

In the present invention, it was found out that this sliding of the brush causes incremental increases of an operating noise of a motor and ripples of torque. Further, in a dynamo-electric machine rotatable in both directions, differences in torque, rotary speed, operating noise, and torque ripples are different with respect to the rotating directions depending on the state of the pigtail.

In the present invention, a spring and a brush are set in a brush holder base. A terminal plate and a pigtail are connected in an area within 90° from an introducing portion of the pigtail in the brush toward an outside of the brush holder. Thus, the pigtail extends in the radial direction of the brush holder (pages 6-7 of specification). Since the pigtail extends in this manner, the direction of the rotation of the motor is not affected by the pigtail, due to its structure and position (see paragraph bridging pages 6-7 of specification).

Thus, this structure in the present invention reduces the negative influences on the sliding motion of the brush caused by flexibility of the pigtail and vibration of the brush in the radial direction, so that operating noise and torque ripples in the dynamo-electric machine can be

reduced when the machine is rotatable in both directions. Until Appellants' invention, this structure had never been conceived for a bi-directional dynamo-electric machine.

VI. ISSUES

Whether or not claims 1-11 are rendered obvious by the combination of Hockaday and Takeuchi.

VII. GROUPING OF CLAIMS

Claims 1-7 stand or fall together. In addition, claims 8-11 stand or fall together due to the additional structure recited therein.

VIII. ARGUMENTS

A. Claims 1-7 are not rendered obvious by the combination of Hockaday and Takeuchi.

Claims 1-7 are not rendered obvious by the combination of Hockaday and Takeuchi because the combination of cited references fails to teach or suggest a dynamo-electric machine that is rotatable in both directions for an electric power steering device and having the pigtail structure of the present invention.

Specifically, claim 1 is directed to the structure of a brush holder for a dynamo-electric machine. A spring (4) and a brush (6) are set in a brush holder base (2). A terminal plate (1) and a pigtail (6a) are connected in an area within 90° from an introducing portion of the pigtail in the

brush toward an outside of the brush holder. Thus, the pigtail extends in the radial direction of the brush holder (see Fig. 4, for example).

This structure reduces the negative influence on the sliding motion of the brush caused by flexibility of the pigtail, and vibration of the brush in the radial direction, so that operating noise and torque ripples in the dynamo-electric machine can be reduced in a machine that is rotatable in both directions. (See pages 8-9 of specification.)

Appellants respectfully submit that the combination of the prior art fails to teach or suggest this feature of having the pigtail structure in a dynamo electric machine motor rotatable in both directions for an electric power steering device.

As noted by the Examiner, Hockaday fails to disclose a motor for electric power steering. This reference also fails to disclose bi-directional movement of the motor.

Hockaday merely mentions that the brush holder disclosed therein can be used with a rotating mechanism such as a commutator.

The Examiner states that Takeuchi supplements the deficiencies of Hockaday, i.e., it would have been obvious for one of ordinary skill in the art to modify Hockaday to employ the brush holder with a motor for electric power steering as disclosed in Takeuchi "for the purpose of generating less electromagnetic noise and high reliability." (Final Office Action, page 3.)

Appellants respectfully disagree with this assertion.

Specifically, one would not have been concerned with generating less electromagnetic noise and high reliability in the device in Hockaday. Hockaday discloses an opening for a

rotating mechanism such as a commutator (col. 3, lines 15-16) but is not concerned with the motor itself and thus, is not concerned with reducing electromagnetic noise in a motor. This reference merely refers to a "rotating mechanism".

Thus, even though Takeuchi may disclose an electric power steering device, there is no motivation for modifying Hockaday to have such an electric power steering device.

Still further, Applicants note that the cited references are completely silent with respect to the effect of a bi-directional motor on a pigtail structure, and thus, there would not have been any motivation to combine the references.

Thus, claim 1 is patentable.

B. Claims 8-11 are not rendered obvious by the combination of Hockaday and Takeuchi.

Claims 8-11 are not rendered obvious by the combination of Hockaday and Takeuchi at least due to the inclusion of the pigtail being introduced from the backside of the brush (see embodiment illustrated in Figs. 10 and 11). Neither Hockaday nor Takeuchi teach or suggest that the pigtail is introduced from the backside of the brush. The Examiner does not specifically address this limitation in the Final Rejection; it appears that Hockaday is relied upon for this feature. However, Hockaday discloses that the pigtail is introduced from the top of the brush (see Fig. 1).

Since neither reference teaches or suggests this structure of having the pigtail introduced from the backside of the brush, the combination of the cited references fails to render claims 8-11 obvious.

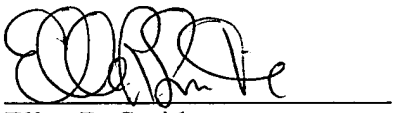
In view of the foregoing, claims 8-11 are patentable.

IX. CONCLUSION

Appellants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 19-4880. The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

CLAIMS 1-11 ON APPEAL:

1. A brush holder for a dynamo-electric machine, wherein a spring and a brush are set in a brush holder base, a pigtail extends from an introducing portion in the brush in a radial direction of the brush holder, and a terminal plate and the pigtail are connected in an area within 90° from the introducing portion toward the radial direction of the brush holder,

wherein the dynamo-electric machine is rotatable in both directions, and

wherein the dynamo-electric machine is a motor for an electric power steering.

2. The brush holder for the dynamo-electric machine according to Claim 1, wherein the terminal and the pigtail are connected in an area around a sliding axis of the brush within the width of the brush.

3. The brush holder for the dynamo-electric machine according to Claim 1, wherein the pigtail is introduced from the brush in a direction toward a motor shaft.

4. The brush holder for the dynamo-electric machine according to Claim 2, wherein the pigtail is introduced from the brush in a direction toward a motor shaft.

5. The brush holder for the dynamo-electric machine according to Claim 1, wherein a column extends from the terminal plate to connect with the pigtail.

6. The brush holder for the dynamo-electric machine according to Claim 2, wherein a column extends from the terminal plate to connect with the pigtail.

7. The brush holder for the dynamo-electric machine according to Claim 3, wherein a column extends from the terminal plate to connect with the pigtail.

8. The brush holder for the dynamo-electric machine according to Claim 1, wherein the pigtail is introduced from a backside of the brush.

9. The brush holder for the dynamo-electric machine according to Claim 2, wherein the pigtail is introduced from a backside of the brush.

10. The brush holder for the dynamo-electric machine according to Claim 3, wherein the pigtail is introduced from a backside of the brush.

11. The brush holder for the dynamo-electric machine according to Claim 4, wherein the pigtail is introduced from a backside of the brush.